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STATE OF CALIFORNIA

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SECRETARY OF STATE

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OFFICE OF VOTING SYSTEM TECHNOLOGY ASSESSMENTS

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Public Meeting

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Transcript of Proceedings

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10:03 a.m.

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Brittany Flores, CSR 13460

1 APPEARANCES

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3 PANEL MEMBERS:

4 Ms. Rachelle Delucchi, SOS - Elections

5 Ms. Rita Gass, SOS - IT

6 Ms. NaKesha Robinson, SOS - OVSTA

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8 STAFF:

9 Ms. Susan Lapsley, SOS - Administration

10 Mr. Todd Ross

11 Mr. Rodney Rodriguez

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1 PROCEEDINGS:

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3 MS. LAPSLEY: All right. Good morning,
4 everyone. Thank you for making the trip over here to
5 the Secretary of States's office. I appreciate
6 everyone's time and coming to attend the public hearing
7 for the ES&S Unity 3.4.1.0 voting system.

8 We haven't had a hearing in quite a while, so
9 some of us are a little rusty, and we actually have
10 three new members of the Office of Voting System
11 Technology Assessments. Some new faces. Ryan left the
12 Office of Voting System -- the Office of Voting System
13 Technology back in March of last year, and we have
14 gained three fantastic assets to the office. I'm just
15 going to go ahead and introduce NaKesha Robinson, Todd
16 Ross, and then Rodney Rodriguez. So it took three
17 people to replace Ryan, but don't tell him that. Okay.

18 Today on the agenda, we'll go ahead do the
19 consultant's report, the SOS report, and then the vendor
20 response to the extent vendor would like to respond, and
21 then we'll take public comment. Just as we have in
22 other public hearings, we will have speaker cards, which
23 if you would like to be a speaker, please fill one out.
24 Rodney is, kind of, sitting back there. I do have three
25 speakers. I have Mr. Turner, Ms. Alexander, and then

1 Mr. Soaper and Mr. Tam are going to -- Mr. Tam is going
2 to succeed his time for Mr. Soaper. So we'll do joint
3 time on that. So we are doing three minutes. Rodney,
4 here, will be our distinguished timer. He will give you
5 a 60-second notice, and then show you when your time is
6 up. And he wanted to use a big hook, but I told him,
7 "No," that wasn't appropriate. So we'll just let you
8 know when the time limit is up.

9 Just as in the past, we are video recording here,
10 so there's video cameras all around. So any comments
11 that you do provide -- plus, we have the court reporter,
12 stenographer who is recording this -- so any comments
13 that you do provide are, obviously, recorded. Please be
14 advised of that, and they will be made as part of the,
15 the official record for this voting system.

16 So with that, let me now introduce our panel, our
17 panel members, who will be listening to the public
18 comment today. I already introduced NaKeshia, but we
19 have Rita Gass, also a new face to some of you. Rita is
20 our chief information officer for the agency.

21 And, Rita, you joined us about a year and a
22 half -- a year ago? So eight months -- does that
23 qualify? Good.

24 And then Rachelle, who is our, our counsel down
25 in, in election division.

1 So they'll be listening to your comment today and
2 being able to relay that to the secretary. A decision
3 will be made within 60 days of this public hearing. If
4 there's any questions or if you want to provide anything
5 in writing, please feel free to do so. And let us know
6 that you're going to be doing so.

7 So with that, we'll go ahead and get started.

8 MR. ROSS: Okay. Paul, if you would like to
9 present your consultant's report.

10 MR. CRAFT: Okay. Good morning, everyone.
11 I'm Paul Craft. I am the President of Freeman, Craft,
12 and McGregor. We were the lead contractor on the
13 testing of the new system. I'm -- for those of you who
14 have read the reports, I'm probably not going to tell
15 you anything new this morning. For those that have not
16 read the report, I'm going to give you a good summary.
17 There were 14 people involved in our testing effort.
18 All of them are experts in their particular piece of
19 testing. Everyone has worked very hard to make these
20 reports very precise and, as we say, exactly what they
21 mean. So our reports speak for themselves. So I'm not
22 going to be able to add anything to the reports. If the
23 panel has a question that they would like asked, we will
24 take that back to the person who was involved in that
25 particular part of the work.

1 And so with that said, let me get started with
2 the functional test report. The, the system tested is
3 basically a complete end-to-end voting system. It
4 begins with the election definition software, the
5 software necessary to program the voting devices and to
6 print ballots. There are two high-speed standards that
7 do your mail ballots and central count. Those consist
8 of E and A testing. There are two precinct counters.
9 The -- let's see -- DS200 and -- I forget the number but
10 the old model one hundred as we generally call it. And
11 then there were three different versions of the AutoMARK
12 marketing device. Then there's software that brings all
13 that together and produces public reports and tabulator
14 totals. It is a fairly complex system. On this
15 particular version, as in older legacy versions, the
16 software modules are all pretty much freestanding
17 modules that exchange files between.

18 So, so basically, to test the system, we used
19 three election definitions. We used a primary election
20 definition, a general election definition, and a recall.
21 The Sacramento County election definition from the last
22 primary, that's the primary election we used. It was
23 used basically taking files from ES&S, which are similar
24 to what they would do if they were providing election
25 services to the county. So for that election, we, kind

1 of, took the position of the county and providing the
2 election information to ES&S, and they brought us a
3 complete election definition and ballots.

4 The general election was Contra Costs County. It
5 was developed as you would develop it using the limited
6 files of candidate contested precinct data as a election
7 that you normally generate their own election. Finally,
8 the, the recall election is basically a election similar
9 to the governor's recall using the logic proving that
10 the system can handle more than a hundred candidate will
11 in an election and that it's also the election that we
12 used to test marginal models. It is -- we set the
13 election definition up where you can go for -- I think
14 it was 75 out of a hundred candidates, and then we used
15 that to create a large ballot where we could exercise
16 lots of different types of pins and marginal marks and
17 make sure that the system could actually read ballots
18 within the specification.

19 So with that, I guess the first thing you might
20 want to hear us talk about -- the marginal mark
21 consistency test. Basically, it was this single ballot
22 that we made out, was fed through each model scanner ten
23 times, and our findings from that were that all the
24 marks were read consistently within the expected range,
25 and there's not a lot of variation in the files, and the

1 variation is important. You want to see -- when you do
2 this test, you're looking to see that, in fact, whatever
3 the machines cut off for readable or an unreadable mark,
4 number one, it's well-handled specifications report. It
5 isn't supposed to be a readable mark for the machine,
6 and then we don't want to see a lot of variation, and
7 that is pretty much what we saw in that.

8 Then the AutoMARK, we, basically, went through
9 its functions. We found that it functioned very much as
10 it has in the past. There were some where we thought
11 there were some improvements in the accessible features
12 of it as opposed to the accessibility that we saw in the
13 past. That accessibility, obviously, is made up largely
14 of the scripts that the machine provides to a voter --
15 accessible in places. So where we did find a
16 disappointing finding there is for -- let me rephrase
17 that. The, the AutoMARK does a good job of providing
18 instructions to a voter who is dependent on the audio
19 ballot if they are using the control panel on the
20 AutoMARK itself.

21 For voters who are using the jelly switches,
22 which are "yes/no" switches, and voters who are using
23 the sip-and-puff device, the instructions for operating
24 the device that's given to you in the audio script do
25 not really work for these devices. The, the regular

1 audio script and the regular control panel allows you,
2 at points, to go backwards in a particular sequence of
3 steps. With the -- with the sip-and-puff switch you can
4 only move forward. So we -- our recommendations are
5 that, basically, either the vendor or the election --
6 using it to develop supplement instructions that would
7 be given to voters who need to use the paddle switch or
8 sip-and-puff devices. And frankly, there's a very small
9 number of people who use that, so it's not going to be
10 something that poll workers will necessarily be familiar
11 with because they don't have many occasions to encounter
12 it.

13 So another feature basically with the sip and
14 puff, because it does go forward only, doing a write-in
15 ballot, writing in a candidate's name can be difficult.
16 We typed in the word "zebra" using one of those devices
17 and just to pick out your letters, you have to go three
18 trips through the alphabet, and basically, one entire
19 trip was to get to "Z," and back to the beginning to
20 "E," and long story short, to type the word "zebra," you
21 have to do 115 presses or sip-and-puff actions.

22 Let's see. Other than that, the AutoMARK does
23 provide functionality for a voter who has already marked
24 their ballot. You can put your marked ballot in and it
25 will read to you what your votes were. However, if the

1 system determines that you have an under-vote on your
2 ballot, it will not allow you to mark the under-vote.
3 You have to take the ballot out and mark the un-voted
4 place by hand with a pen or spoil your ballot and get
5 another ballot if you are actually dependent on the
6 AutoMARK for doing the ballot. When the AutoMARK
7 finishes marking the ballot, it ejects it. With that,
8 we saw a issue that we have seen with prior generations
9 of the AutoMARK. It takes a fair amount of hand
10 strength to pull the ballot out of the mouth of the
11 machine, and frankly, it's best done with both hands.
12 So voters with limited hand strength or use of only one
13 hand, they require assistance to remove the ballot.

14 As to the ballot standards, the M100, DS200, 850
15 scanners all performed as suspected. Ballots were fed
16 in all four orientations. Small number of mis-fed
17 ballots, again, occurred. These generally happened when
18 the operators feeding the ballots inserted the ballot
19 before the previous ballot finished its scanning.
20 Frankly, the machines performed quite well. The M650
21 scanner, though, remains a very difficult machine. It's
22 a complicated machine to operate. It requires a trained
23 and experienced operator in order to feed the ballots.
24 The voter has to apply thumb pressure. My observation
25 has always been that it takes a lot of experience to

1 know how much thumb pressure to apply and to keep the
2 machine feeding nicely. When a mis-feeding jam occurs,
3 the machine will produce, kind of, ambiguous error
4 messages. We had a ES&S staff person assisting with
5 that test, and even they had trouble determining exactly
6 what to do when it jammed on this. And basically, she
7 pretty much just had to stop and count the number of
8 cards in the output hopper, compare that to the number
9 of cards that are being fed, and if a ballot is
10 accidentally scanned twice, your only remedy is to flush
11 the precinct or to clear the machine of all ballots.
12 ES&S has not provided us with a card that was necessary
13 to flush the precincts, so we were pretty well left to
14 clear the machine if we had a mis-feed. Once again,
15 this is a thing that an experienced operator knows how
16 to handle, but it does take a fair amount of skill.

17 The 650 also handles ballots in only one
18 orientation. So the ballots must be loaded face up with
19 the top of the ballot to the left and the notched
20 corner in the corner of the input hopper. In our
21 testing, the ballots had a tendency to curl. They were
22 basically all curling up. That's based on the paper
23 orientation, where it was printed, and the humidity in
24 the room. But in our case, they were curling up from
25 the center to the edges. That caused a lot of things to

1 hit the top edge of the scanner mouth resulting in jams.
2 I understand the ES&S, in their next generation system,
3 will not have the 650 in it, so that probably will go
4 away.

5 And final results reporting capability, we found
6 that the system cannot accommodate provisional and late
7 processed absentee ballots by either adding to the
8 previous tabulated totals or setting up separate
9 recording groups for the additional ballots to be
10 scanned. This system would not handle certified
11 write-in candidates because that was not included in the
12 election definition. After canvassing, write-ins must
13 be hand counted and manually entered into the statement
14 of votes cast.

15 And -- let's see. Some significant findings, and
16 these are notes, the report printing option on the
17 Election Definition Manager for reporting -- for
18 printing reports in PDFs, you have two ways to create a
19 PDF. You can print a PDF or you can export a PDF. If
20 you print the PDF, you get an error message. So the PDF
21 files have to be produced through the use of the
22 exporting. I'm not sure if ES&S has added that to their
23 documentation or not. An idea solution would be
24 basically greying out that print option.

25 Let's see. There is an issue on ballots that's

1 produced in multiple language because there's a unique
2 ballot for each language, the languages will have
3 different sized text blocks. This can change the spaces
4 available to the ballot, which can lead to errors. So
5 the user creating the ballot must check to adjust the
6 spacing so that the oval is in the correct position.
7 Once again, although the procedures for instructions for
8 adjusting/floating the spacing, this really should be a
9 required step when the ballot is created.

10 The system ran the primary general elections
11 without any tabulations errors. A number of
12 documentation errors were found and put to ES&S for
13 revision.

14 And -- let's see. Oh, when the AutoMARK is used
15 to view a previously marked ballot containing a write-in
16 vote, it will verify that the write-in is selected, but
17 it is not capable of verifying the text within the
18 write-in. There is a previously existing anomaly known
19 as the "Chinese Character Anomaly," in which certain
20 Chinese characters are translated with an ANSI value of
21 254. Would basically stop the text from -- it's
22 basically, 254 is read as a end of line marker. ES&S
23 regulated that into the system. So in this version's
24 system, that is no longer an issue.

25 There is a "Code Channel Eleven Anomaly," which

1 some jurisdictions have had problems with, in which a
2 ballot containing a type 11 code as a disputed scanner
3 misread, and it, basically, is identified as an
4 unreadable ballot. And -- I'm sorry. Instead of being
5 read as an unreadable ballot, it's interpreted as a
6 ballot header card, causing the ballot not to be
7 counted. Once again, there's a workaround for this,
8 which we tested, and ES&S provided analysis and
9 procedures, which resolve it.

10 And that is, I think, pretty much it as
11 significant issues in functional tests. We were able to
12 verify that our test used three languages, English,
13 Spanish, and Chinese. We verified all three languages
14 were used. And the rest of the things here are pretty
15 minor, and we can get those out of the report.

16 So for the software of the report, the, the
17 static code analysis revealed 27 issues and the public
18 search identified 22 vulnerabilities that could be
19 potentially used for attack of the voting system. They
20 did not find any critical vulnerabilities. Six of the
21 reported vulnerabilities for immediate security. The
22 rest of them are low. And basically, in low, severe in
23 finding is one where the use of the impact is very low.
24 It's hard to mitigate the system or the difficulty in
25 exportation will require indefinite access to the

1 system's expert knowledge and will require cost for
2 unlimited resources. Immediate security findings,
3 medium implies that the impact of exportation will be
4 significant with the difficulty in exportation will
5 require extended access to the systems informed
6 knowledge will require significant access. High
7 severity is the one you really worry about. That
8 implies either the impact or exportation of the product
9 would result in complete compromised security of the
10 difficulty in exportation will likely require little to
11 no access or knowledge. There were no high severity
12 findings in this assess. There were six mediums. There
13 were -- let's see.

14 I hope I can explain clearly. Sometimes, I get
15 too close to the stuff. The static code and analysis
16 basically looked for common vulnerability exposures.
17 There are basically published list of common
18 vulnerabilities for different components in the systems
19 such as when does 7-0 has a known list of common
20 vulnerabilities. They did an inventory of common
21 vulnerabilities that this system contains based upon the
22 off-the-shelf products that are incorporated in it and
23 based on some of the code modules that were used. There
24 is a list of those, and those are detailed in the
25 report. The static code of analysis and documentation

1 review basically is where we found our medium
2 vulnerabilities. Now, the approach that they take in a
3 code review is a combination of manual code analysis and
4 also an automated search for targets for analysis. As
5 you know, all tests, alternatively, it's a sampling
6 process. They attempt to locate the highest risk areas
7 in the code and then focus in on those with manual --
8 with use. So there were, basically, in the medium
9 range, there were weak encryption algorithms and
10 encryption, decryption key generation algorithms were
11 used which are not approved by Mist. These are
12 basically medium strength primarily because of the lack
13 of Mist approved. Nonetheless, these are -- these are
14 algorithms which were once approved by Mist and have
15 recently lost approval. They are fairly sound
16 algorithms, but they are, I think, legacy of the -- this
17 was an old system. Not, not approved algorithms include
18 Glow Fish and SRC 1632.

19 There are places where the documentation is not
20 up-to-date. Documentation for the system hasn't been
21 updated consistent within the product, and there, there
22 is an issue with time synchronization. There were no
23 instructions given in regard to setting time in the
24 system. Being able to reset the date and time or open
25 potential vulnerabilities in regard to time functions.

1 Other than that, there are -- there are four more
2 pages of those vulnerabilities. All of them are low.
3 The majority of low ones are areas where the code did
4 not comply with the requirements of the voluntary voting
5 system guidelines, which are published by the EAC, and
6 those speak for themselves. There are things I --
7 the VVSU requires no line of code exceed 80 columns in
8 length including comments and tags. That requirement
9 from VSG comes back from the days when we were looking
10 at 80-character monitors and mainframe computer systems.
11 With modern monitors and modern competitors, that's not
12 quite as serious as it might have once been. So those
13 all speak for themselves. So, so -- and that is
14 everything that I have flagged on source page.

15 Okay. Breaking vulnerability analysis. Our
16 approach is finely geared toward numerating system
17 mis-configurations and vulnerabilities based on the
18 federal information assistance guidelines and computer
19 network security research. Our analysts collect system
20 configurations vulnerability data and evidence of
21 exportation of the known vulnerabilities. Testing
22 methodologies are based on Mist 830 risk management
23 guide for information technology systems, and on 860,
24 line one, guide for mapping types of information
25 recommendation systems and security. These focus on

1 system characterization, threat source identification,
2 vulnerability identification, control analysis,
3 likelihood of attack, and impact analysis. Source data
4 for mis-configurations and vulnerabilities include the
5 visa security technical issue guide, Mist, United States
6 government configuration baseline, and vulnerabilities
7 published by Mist national vulnerability database and
8 minor common vulnerabilities from exposures.

9 The analyst for task, we have discovered physical
10 and logical vulnerabilities within the unit system that
11 result in compromising the confidentiality integrity
12 availability of the system. The team tested the ES&S's
13 proposed system configurations and hardening procedures
14 in accordance with federal information assurance
15 guidelines specified by Mist. The use through Mist
16 security contact augmentation protocol, the test system
17 hardening procedures of web stations. In doing this,
18 they found 269 missed configurations in the server, and
19 303 missed configurations in compliance and ERA
20 workstation as well as multiple security breaches that
21 were missing from all stations. Now, with that said,
22 this is not quite as damning as it sounds. But we
23 believe it is -- it is important and it is a important
24 thing for ES&S to consider moving forward. There is a
25 federal standard for hardening and configuring a

1 computer division where it is secure. It is mandatory
2 for federal agencies. But it is, obviously, a very good
3 practice, perhaps a best practice. So the systems were
4 evaluated against that standard. You know, there can be
5 an argument made that that standard does not apply,
6 that, obviously, is an issue for the vendor and the
7 committee to take up.

8 Let's see. The DSE50 system contained at least
9 seven vulnerabilities with the highest score of ten,
10 while the DS200 had two. Okay. So our physical
11 security evaluation has discovered that the wire seals
12 used to preserve the integrity of the election to
13 modify, to open and close with little or no visible
14 damage to the outer casing. This makes it possible to
15 open ballot boxes, access contact flash guard doors, or
16 obtain printer access. Flat key locks with the
17 exception of the double-sided locks in the DSA50 were
18 easily opened with a cheap lock-picking set obtained
19 through a internet video.

20 Finally, it was discovered the integrity stickers
21 applied for the assessment were easily removed from the
22 plastic cases without triggering any integrity
23 safeguards. For those of you not familiar with those --
24 these stickers, when you remove them from an object --
25 will basically show physically, usually, the word

1 "void," "compromised," or something to that effect. For
2 some reason, on the plastic cases, they could be removed
3 without showing that alarm. On the metal cases, any
4 attempt for removing triggered the safeguard on issued
5 attempt.

6 In both DS200 one and DSA50, the analysts found
7 the file systems were not encrypted and that allowed the
8 team to recover system configuration information,
9 password hashes, and ES&S specific binaries. There were
10 later discovered the 850 performs an integrity check
11 that prevents the system from booting from a modified
12 boot device. However, the DS200 does not perform these
13 checks, and they were able to boot it from a modified
14 boot. Further investigates in 200 a weak, weak boot
15 password was discovered along with a SSA server that
16 allows root log-ins and the ability to trigger the
17 system memory. This can ultimately lead to a malicious
18 act or obtaining the DS200 flash guard, modifying the
19 system's configuration and putting the modified
20 operating system into production unbeknownst to election
21 officials.

22 So finally, analysts discovered that once an
23 election is complete, election result tallies are
24 attended to original election definition file and
25 encrypted and read back to the US -- investigators were

1 unable to find these values from test elections in an
2 attempt to modify the system. However, there was checks
3 done, which prevented the recording of the modified
4 election sent to the election manager. They spent a
5 amount of time attempting to reverse the file format
6 without any success. However, they feel that with
7 proper resources and time, the checks and value could
8 have been found and modified to allow importing the
9 modified election as long as no other form measures were
10 in place.

11 Finally, along with the result tallies, the DS200
12 uploads the full ballot images into the US media
13 unencrypted and without file integrity mechanisms. I
14 found integrity mechanism would be something such as
15 MD-5 hash or something, which would allow you to tell if
16 the image had been manipulated. All of California does
17 not use ballot images and determine election results.
18 For those jurisdiction that do, it could be significant.
19 The investigators were able to modify the ballot images
20 and replace the originals in US media without triggering
21 any counter measures or integrity check within the
22 system. This operation, at minimum, could lead to a
23 delay in the election process if the scanned ballots
24 were to be -- so that is -- I hope that was clear as
25 mud. That was basically a quick summary of what they

1 found, and I guess I will take questions.

2 MS. LAPSLEY: Thank you, Paul.

3 Do any of the panel members have questions,
4 concerns?

5 No. Great.

6 Again, thank you to Freeman, Craft, and McGregor
7 for doing the testing and the reports on this Unity
8 3.4.1.0 system.

9 For those of you who may or may not have been
10 able to find our report, they are on our website. They
11 are at SOS.CA.gov, backslash, elections, backslash,
12 voting-systems, backslash, oversight, backslash, public
13 announcements and hearings. So we're in the process
14 actually of -- nice segue into -- we're in the process
15 of revising our -- the OVSTA and voting technology
16 portion of the website. So stay tuned. These items
17 will be easier to find in the next coming months.

18 So with that, we'll next have the staff report,
19 and Todd Ross will be presenting the Secretary of State
20 staff's report.

21 Thanks, Paul.

22 MR. CRAFT: Yeah.

23 MR. ROSS: So examination and review for
24 certification in California is a very comprehensive
25 process. After FC and G was finished with the source code

1 and red team and functional testing, OVSTA performed
2 stress and volume testing on this system. We tested it
3 to the California volume test protocol of July 3rd,
4 2016 -- July 13th. Excuse me. August 16th and 17th of
5 last year, we borrowed the Sacramento County election's
6 office warehouse and tested many, many machines. Volume
7 and stress testing is essentially a simulated election
8 to make sure that this system can perform as expected in
9 a simulation election. We tested twenty M100s, fifty
10 DS200 tabulators and forty AutoMARKs. For the
11 tabulators, we used 14 test decks of 400 ballots each.
12 They were actually two-card ballots so 800 cards each.
13 We fed a test deck through every tabulator. At the end
14 of the tabulations, they -- each machine tabulated
15 correctly. We didn't experience any failures or
16 problems, let alone any catastrophic failures. We
17 compared the test decks across the tabulators because we
18 had 70 tabulators and 14 test decks. We used each test
19 deck about five times. So we compared them not only
20 across tabulators but with the paper report, and they
21 all tabulated without a single error. On several
22 occasions, we experienced a minor problem with some of
23 the DS200s, in that, after you feed many, many, many
24 ballots into one of these tabulators, we would -- they
25 would experience a jam in almost every case. What we

1 did was slide the tabulator forward and settle the
2 ballots in the box because there were so many and slide
3 the tabulator back in place and away we went.

4 So the, the tabulators performed admirably. So
5 for the AutoMARK DREs, we created a hundred ballots from
6 each AutoMARK and tested 40 of them as I have said. At
7 the end of ballot creation, we looked through all the
8 ballots and identified 96 that we thought were -- we
9 wanted to test. Of those 96, we ran them through a --
10 an M100 and ADS200. The M100 tabulated them correctly
11 in every case. The DS200 tabulated all but one
12 correctly. That one ballot was actually a snowman,
13 where the mark was just above the actual bubble on the
14 ballot. So -- but we didn't experience any errors. We
15 didn't experience any problems. The machines worked as
16 expected and worked very well. So -- any questions?

17 MS. ALEXANDER: On the AutoMARK, did you
18 test them using the --

19 MS. LAPSLEY: Why don't we use this, because
20 it's going to be hard for the court reporter to hear you
21 and identify for the record.

22 MS. ALEXANDER: Oh, sure.

23 Hi. Kim Alexander with the California Voter
24 Foundation. I just was wondering, when you tested the
25 AutoMARK, did you test them using the headphones or the

1 sip and puff or did you just test them --

2 MR. ROSS: Not during volume testing.

3 Volume and stress is essentially just what it sounds.

4 It's to simulate the number of ballots or use that you

5 would experience in an actual election. So they were

6 using the, the screen portion of it, but none of the

7 accessibility. During the functional, we did. Yes.

8 MS. ALEXANDER: Great. Thank you.

9 MS. LAPSLEY: All right. Thank you, Todd.

10 Now, who from ES&S would like to -- why don't you

11 go ahead and come over to the podium and address -- make

12 sure you say your name for the record so that the court

13 reporter can get you on the record.

14 MR. PIERCE: Good morning. My name is Steve

15 Pierce, and I am the vice president of voting systems

16 for Election Systems and Software. I have been with

17 ES&S for 16 years. My primary responsibilities are to

18 manage the federal testing of all of our voting systems

19 as well as all state certification, compliance, and also

20 the installation of all of our network systems across

21 the country.

22 First of all, I want to thank you all for this

23 opportunity, and, Assistant Secretary Lapse, I

24 appreciate the opportunity to be here, and you have a

25 tremendous staff, and I want to commend Mr. Craft on the

1 great test campaign that was run on the Unity 3.4.1.0
2 release.

3 3.4.1.0 is -- it's a mature system. It was
4 originally certified in April of 2014 by -- and it was
5 tested by the Election Assistance Commission. It was
6 tested by Wile Laboratories at that time. It's, it's
7 currently used in third -- 24 different states. There's
8 373 counties that are using the 3.4.1.0 release since
9 that timeframe. We have run in excess of a thousand
10 successful elections with this release. So I want to
11 reiterate that this is a very mature system and it's
12 a -- and I really feel confident that California
13 counties will be very pleased with this release. It
14 provides them a significant number of improvements over
15 the current systems. And particularly, these are all
16 items that are driven by the current standards that this
17 was tested to. The systems that are currently used in
18 the state, the prior systems were tested to the 2002
19 voting system standards. This system has been tested to
20 the 2005 VVSG, Voluntary Voting System Guidelines. And
21 the primary benefit of those in that -- in that standard
22 is -- was the improvements in security, accessibility,
23 and auto-ability. And so these systems, while
24 undergoing -- and this is not a first generation test of
25 the Unity 3.4.1.0 release. Prior to that, there had --

1 it had undergone the unity -- this succession of unity
2 releases had gone through at -- off the top of my
3 head -- roughly, five EAC test campaigns and tested to
4 this standard. So it's been an iterative process and
5 with continual improvement every step of the way.

6 3.4.1.0 introduces some new products to the State
7 of California. The DS200 is a digital precinct scanner.
8 It's a -- it's an alternative to the model 100 optical,
9 that precinct optical scanner that's been in use in the
10 state for a number of years. We have nearly 30,000 of
11 DS200s in the field that have been in use probably for
12 about six years, and the, the system that was tested
13 here was a third generation of that product. So we
14 continue to improve those for performance, reliability,
15 and, and speed for processing ballots. What else can I
16 say. The DSA50 is our new high-speed digital central
17 scanner. It's the alternative to the model 650 optical
18 scanner -- high speed optical scanner that has been used
19 in the State of California also for quite some time,
20 probably in excess of ten, twelve years. We have -- the
21 850 has been in the field for approximately three years,
22 been under numerous EAC test campaigns, and there's just
23 under 300 of those that are in use in the field. And as
24 I mentioned, some of the other key features of this
25 release, 3.4.1.0, over the unity 3011 release that is in

1 use in the State of California, being that it was tested
2 to these 2005 standard, it really does address, from a
3 security standpoint, it introduces the requirement for
4 hardening of your, your operating system environment.
5 So all of your election management systems environments
6 is, is now a lock down hardened, meaning that Windows
7 applications that aren't necessary for use with the
8 system are disabled. People are not allowed to -- the
9 system prevents you from installing applications.
10 There's no editors on the system so that nobody can get
11 in and modify any of the -- any of the data. But also
12 from an auto-ability standpoint, every event, either at
13 the Windows level or the application level in the EMS is
14 logged. So one of the other -- that's one of the other
15 key, I would say, features of the newer standards and
16 these newer systems is that from auto-ability
17 standpoint, everything is traced. So when you go back
18 and you want to relook at what happened, you can see the
19 series of events, every series of event that took place
20 in that EMS environment.

21 As Mr. Craft mentioned, we use -- when the system
22 was certified under the EAC program all throughout the
23 system, the system is utilized in this to prove
24 cryptographic modules, and the, the -- under the EAC
25 program, once a system -- as you approach the system, as

1 you go through the test campaign, what the labs do is,
2 at that point, they go out and they grab the latest cuts
3 for, for all the environments. We provide the latest
4 Mist-approved cryptographic modules for use in the
5 system, and that is what gets built and locked down.
6 Our systems, they become very static. Once, once the
7 trusted fields are performed, there's no changes to
8 these systems, and if there are, we have to go through a
9 very vigorous process under the EAC program to apply for
10 modification.

11 So when we talk about vulnerability, Mr. Craft,
12 while these cryptographic libraries are now on the
13 historical list of Mist because they evolve every year,
14 this system has been out there for a long time. It's
15 locked down. It's secured. There's no access to the
16 internet, and there's no risk here. And again, the
17 testimony is the thousands of elections that have been
18 successfully run with this system.

19 What else. I talked about the auto-ability, and
20 really, while it introduced some new components to the
21 system, our California County customers are familiar
22 with the unit sweep and the legacy products that are
23 there, but in general, all of those systems -- every
24 component of this system has had some upgrade and some
25 flavor of -- throughout the system from what they have

1 been used to using.

2 The last thing I will say, and I'm going to go
3 back to the integrity of the system and the security of
4 the system, the auto-ability and the logs are what's
5 critical under this system should anybody go and --
6 which would be someone at maybe assist admin level,
7 which generally, there's only one person in accounting
8 and it has to be a trusted source. If anybody were to
9 go in and disable any of the logs anywhere, that system
10 will stop running, and so that's another key feature.
11 We're really proud of this release. We're excited to
12 have had the opportunity to have it tested. I'm here in
13 the State of California, and we're, we're, we're hopeful
14 that following today's public hearing, it will receive
15 approval to move forward for our -- for all of our
16 California customers.

17 Be happy to answer any questions.

18 MS. LAPSLEY: Thank you, Steve.

19 MR. PIERCE: Okay.

20 MS. LAPSLEY: Why don't you go ahead and
21 introduce Brooke. Brooke is, obviously, new to
22 California and the California process although she was
23 the one who spearheaded this testing campaign for the
24 state. So would you mind introducing her.

25 MR. PIERCE: Absolutely. And I was remiss

1 in doing so. It's the first line item I had here.
2 Brooke Themes is a state certification manager for the
3 State of California. She's part of our certification
4 team at ES&S.

5 So, Brooke, if you want to stand up so that
6 people can recognize you. Brooke will also be
7 spearheading our next test campaign, which is getting
8 ready to start here very soon. I'm hoping this month,
9 we get that test campaign kicked off as well with
10 another subsequent release. Thank you.

11 MS. LAPSLEY: Great. Thank you.

12 Any questions for ES&S?

13 MR. SOAPER: Good morning. My name is Jim
14 Soaper. I'm with the Voting Rights Task Force, and I
15 would like a clarification, because you emphasized that
16 things get locked down. Does that mean that if the
17 operating system, be it a Windows or a Lennox variant,
18 if they come up with security patches, they're not
19 installed?

20 MR. PIERCE: They are not. Under the EAC
21 program, there's -- the only provision for that would be
22 to go back through recertification of that system, and
23 the fact that these systems are not -- and there's no
24 interaction with the internet and there's no, no new
25 applications introduced to these systems, the fact that

1 they're locked down protects, protects that environment.

2 MR. SOAPER: Including the cut software?

3 MR. PIERCE: Correct.

4 MR. SOAPER: Okay. Thank you for the
5 clarification.

6 MR. PIERCE: Yeah.

7 MS. LAPSLEY: Great. Any other questions?

8 MS. ALEXANDER: Thank you. Hi. Kim
9 Alexander, California Voter Foundation. I was really
10 interested in the feature that you described about how
11 the system would lock down if someone tried to audit --
12 change the audit or stop the audit logs and I was just
13 wondering if that was something that was tested and if
14 there are other security features that you have that
15 maybe aren't in the testing protocols that you market to
16 your customers and just wondering if the protocols that
17 we have to cover those, those, those kinds of features
18 and if there are other ones besides that one that maybe
19 need to be tested for marketing purposes.

20 MR. PIERCE: That feature, there, is
21 actually a requirement under the voting system
22 standards, the newer standards to prevent -- as I
23 mentioned, VVSG, when it was introduced, it really
24 focused on security auto-ability and accessibility were
25 the three key components, there, with that system. So

1 that logging, we went through extensive changes in all
2 of our systems because the logging criteria became much
3 more stringent and comprehensive. So we have opted in
4 our systems through all modules, we log everything,
5 every event. And all of those logs are available, you
6 know, postelection for auditing, and, and we have tools
7 to help evaluate what transactions took place. So we
8 know if, if anybody -- when people logged in, who was
9 authorized to log in. There's multiple levels of
10 password protection and that gives you certain roles and
11 rights to, to access to the system which would be assist
12 admin level, that would be at the highest. At the
13 lowest level, there's -- Brooke, there's three levels of
14 log-in?

15 MS. THEMES: Correct. There's admin, as
16 Steve pointed out, that gives rights to almost
17 everything that changes. Usually -- thank you. As
18 Steve pointed out, there's usually only one assigned
19 individual. There's the admin user. There's also an
20 e-admin, gives you some rights to actually create the
21 election definition and layout the paper ballot itself
22 doing some work in AIMS, which is auto work. And then
23 there's an e-define log-in, which just simply allows you
24 to log in, into what they call ESSI, which allows you to
25 log in the paper ballot. And then there's also an

1 e-result user log-in that just allows you to log in and
2 get ERN for result accumulation.

3 MR. PIERCE: And typically, that's only set
4 up by one person that has the highest authorization to
5 set that up for each election, so passwords will change
6 for each election.

7 MS. ALEXANDER: Did it get tested?

8 MR. PIERCE: All of those items that we
9 discussed --

10 MS. THEMES: Yes.

11 MR. PIERCE: -- there. I'm not sure how
12 they're tested here, and Brooke might be able to answer
13 that, but under the, the voting system test lab, the EAC
14 all accredited test lab, all of those features are
15 thoroughly tested.

16 MS. ALEXANDER: Thank you.

17 MS. THEMES: Correct. And that's actually a
18 part of when we configure these systems, we actually run
19 a series of scripts when they're being configured, and
20 that's one of the parts of it, is setting up those user
21 roles. So we did go through and set those up and test
22 those. Yes.

23 MS. LAPSLEY: Yes.

24 MR. SOAPER: Again, Jim Soaper. I -- the
25 DS200 precinct scanners used in Wisconsin, even though

1 the citizens were told they did not have wireless, they
2 definitely did have cell modems in there, and in
3 California, that's forbidden. What is the status? How
4 do we work that? How do we know that the systems used
5 in California do not have these cell modems or at least
6 they're so totally disabled they can't be used. They
7 were being used in Wisconsin.

8 MR. PIERCE: Correct. We have a number of
9 states in counties throughout the country that do modem
10 their results, the unofficial results, after the polls
11 close. They are authorized to do that in those states,
12 and they're certified to do that. With 3.4.1.0, they're
13 -- all modeming capabilities are disabled. For each
14 release, 3.4.1.0 was an EAC certified release without
15 telecommunications. We have a companion release, and
16 it's named unity 34-11, where -- what that lab does is
17 they just do a rebuild of the -- of, of H -- our HPM,
18 our Hardware Programming Manager, the DS200 firm wire
19 and ERM, Election Reporting Manager, to enable the, the
20 abilities to enable modeming capabilities. So those,
21 those features are not in 3.4.1.0 only in a 34-11
22 release, which was not applied for certification. So
23 if, if anybody were to stick a modem -- open up a
24 machine and stick a modem in there, the machine wouldn't
25 even know it's there.

1 MR. SOAPER: So the -- it's only the
2 modem-less systems that are available in California?

3 MR. PIERCE: Modem-less.

4 MR. SOPER: Modem-less?

5 MR. PIERCE: Yes, correct.

6 MR. SOPER: Okay. Thank you for clarifying.

7 MS. LAPSLEY: Is that a technical term,
8 "modem-less"?

9 So with that, we will go ahead and open it up to
10 our -- the public comment. Again, we have the three
11 speaker cards. If anyone else would like to speak,
12 again, please fill out a speaker card and provide it to
13 Rodney. And first, we have Mr. Turner from the
14 California Association of Voting Officials and then on
15 deck, we have Ms. Alexander from California Voter
16 Foundation.

17 And I'd ask you to go ahead and state your name
18 for the court reporter, please.

19 MR. TURNER: Hello. My name is Brent
20 Turner. I'm with CAVO, California Association of Voting
21 Officials. We failed this particular ES&S system on
22 three points, design, software, and accessibility
23 components. The botched designs that have persisted in
24 California in conjunction with insecure proprietary
25 software have allowed a penetrable environment and a

1 collapse of voter confidence. ES&S -- before we feel
2 badly for them because I'm sure they're all nice
3 people -- they have the ability to do the right thing
4 here, and they're choosing not to. There seems to be a
5 severe disconnect between what I'm hearing from Mr.
6 Craft and the comments made by the representative of
7 ES&S. Please note there is an availability of
8 appropriate systems that are running on general public
9 license open source in New Hampshire and this is,
10 apparently, our country's secret is that we're suffering
11 this affectation of Microsoft in vendor lobbyist efforts
12 that they're prohibiting proper voting systems.

13 Currently, some say that California systems,
14 though deemed horribly insecure by our own California
15 Secretary of State, Debra Bowen, talked about in review
16 are at least better than the worst of all systems in
17 other territories, but this is not the leadership that
18 we're looking for. Senator Bowen went to great lengths
19 to expose the vulnerabilities and actually find this
20 particular company a large amount of money for having a
21 different software in escrow than was out in the field.
22 So that, taken in conjunction with Mr. Craft's
23 observation, should make us all pause regarding the
24 certification of this system. These corporate
25 controlled, vote-counting systems continue to plague our

1 democracy as is shown by the events of the day. To turn
2 a blind eye and keep stamping them with approval is a
3 breach of the public trust and, again, puts us on the
4 wrong side of history. Please follow NASA, the
5 Department of Defense, and the State of New Hampshire by
6 rejecting these systems and the vendor lobbyists while
7 moving toward properly secure open source voting
8 systems. Thank you

9 MS. LAPSLEY: Thank you very much,
10 Mr. Turner.

11 Next, we have Ms. Alexander.

12 MS. ALEXANDER: good morning. Kim
13 Alexander, California Voter Foundation. I wanted to
14 applaud the Secretary of State's office and vendors that
15 have worked to test this system. I have been part of
16 the California voting system testing and certification
17 world since 2003, and we have come a long way as a state
18 and improving our testing protocols as is evidenced by
19 the red team testing and the stress testing that's
20 conducted. Other states don't perform these kinds of
21 tests, and I just want to say, for the record, how much
22 we appreciate the hard work that this office and its
23 consultants have put into the process in making sure our
24 voting systems are secure.

25 I am concerned about ports on any voting system,

1 and these systems and its components do have ports that
2 people can see and raise concerns from voters about
3 whether there are vulnerabilities. Even if there is no
4 modem inside the machine, voters don't realize that
5 different states have different voting systems and that
6 there are these important distinctions. So it's very
7 important that we have not just physical security of the
8 system in actuality but also in perception, because,
9 voters go into the voting places, and they see these
10 open ports, perhaps, on a machine, and they worry. So
11 we want to alleviate that. In my own experience dealing
12 with monitoring voting equipment here in California, in
13 use of actual polling places, I have seen poll workers
14 open up voting machines in polling places, see these
15 security seals on the machines, not know what they're
16 for, rip them off, completely invalidate right there on
17 the spot the whole value of having the seals in the
18 first place. So there's a lot on the back end in terms
19 of use procedures and poll worker training and, and,
20 physical security at any port on any voting machine in
21 any component whether it's in the field or in a county
22 election office that needs to be secured.

23 I'm also just overall, really struck by, you
24 know, the fact that we are in this position in
25 California where we do need to buy new voting systems,

1 and I have been promoting that in my work with CVF to
2 provide more state funding to do that, but these systems
3 that counties can purchase, while they're new in some
4 respects, are still operating on rather old fundamental
5 software that has been updated and updated and that is
6 leaving us to miss out on some security opportunities
7 that we need to keep an eye on especially in light of
8 the fact that we do know that foreign cyber interference
9 in the 2016 presidential election was real, and we do
10 have these vulnerabilities in our systems even in
11 California where we're doing the best, I think of
12 anyone, that need to be secure.

13 I also want to just note that I think the
14 AutoMARK needs more work. It's meant for people with
15 disabilities. In my experience in using the AutoMARK,
16 it's been not very user friendly. I appreciate ES&S is
17 trying to make further improvements, but because of its
18 lack of use, poll workers and voters alike don't get
19 used to using it. They don't understand its
20 peculiarities. So I think that whatever we can do to
21 improve that would be better, and I think that I will
22 wrap up because my time is up. So thank you very much
23 for listening, and I'm happy to be available to anyone
24 after the hearing if you'd like to further discuss any
25 of these comments.

1 MS. LAPSLEY: Great. Thank you, Kim.

2 Next up, we have Mr. Soaper and Mr. Tam from the
3 Voting Rights Task Force, and as I said earlier, I
4 believe that Mr. Tam has succeeded his time to
5 Mr. Soaper.

6 MR. SOAPER: Good morning. Thank you for
7 holding this hearing and to everybody involved in the
8 certification process here. My name is Jim Soaper. I
9 am the author of a website called Counted as Cast. I'm
10 cochair of the Voting Rights Task Force, and I'm a
11 senior software consultant. It was mentioned before
12 some of the security vulnerabilities -- 269 missed
13 configurations on the server, 303 missed configurations
14 on the client's, security patches missing, nonstandard
15 file systems, file systems not encrypted, fields that
16 can be bypassed. This is not reassuring. It -- the
17 summary was, "It's not worse than what we have already."
18 Well, okay. We're not going to oppose it -- oppose it
19 on that point. But it's not encouraging.

20 One thing I would like to commend ES&S for having
21 is ballot images. I think you're seeing across the
22 country a push to making those ballot images accessible
23 to people who need to conduct public audits of the
24 system. What is disturbing is that these images can be
25 Photo-Shopped. They're just straight bitmap, and

1 there's no encryption. I would like to recommend to
2 California to consider as part of the future standards
3 and to ES&S that they look into something like PNG
4 format, which has multiple layers of, I'll call it,
5 scrambling including encryption within it so that once
6 the file is created, it cannot be fiddle with without
7 detection and that was an important extra step. So I'd
8 like to recommend that in future systems in California
9 and to ES&S.

10 We are -- we're getting something that's not
11 worse than the previous system. That's the okay news.
12 We're not really getting good systems, new systems, and
13 part of that may be because California has separated its
14 testing from EAC, but it was mentioned before by Kim,
15 we're doing a better job of testing, so I think that's a
16 good move. But we need -- there are -- we need better
17 systems. There are numerous open source projects out
18 there, especially notable from Los Angeles and San
19 Francisco County. They need funding from the State to
20 move forward faster and to build better systems. The
21 state will benefit enormously. In my estimation, in the
22 hundreds of millions of dollars for matching funding
23 that would be ten, \$20 million per county. I would also
24 want to recommend that the state waive the certification
25 and testing fees for any system that discloses its

1 source code and data. This is -- this is a big hurdle
2 for -- especially counties and universities and
3 foundations. They don't have -- I'm not quite sure what
4 the costs are, but I'm going to guess they are similar
5 to EAC, around a million dollars. They don't have that,
6 and that's keeping systems outside of California that we
7 need to let in and, and open the door for them so that
8 we can get to them. That it took two years to -- the
9 certification application was made February 6, 2015, and
10 it's two years later. That strikes me as a little slow,
11 and there's, obviously, going to be reasons for this,
12 but maybe we need to review that.

13 And last thing, a recommendation for California
14 to establish as a standard and recommendation for ES&S
15 election results reporting subgroups, which sets results
16 reporting -- and it's called the election reporting
17 subgroup -- sets a standard for results reporting. We
18 are getting many things in spreadsheet formats, but
19 what's in the columns and what's in the rows varies from
20 county to county. If you use the standard like this
21 and -- as has been the proper software to read the data
22 into this standard, then we'll be able to get everything
23 the same across all 58 counties and across the thousands
24 of counties in the country. So I would recommend that
25 they look at adopting that, both California and ES&S.

1 Thank you very much for your time and
2 attention. We appreciate the ability to present our
3 ideas here. Thank you.

4 MS. LAPSLEY: Great. Thank you, Mr. Soaper,
5 Mr. Tam as well.

6 I appreciate everyone coming out and your time
7 today. There's no further public comments. As I said,
8 we will be going to the Secretary of State and making a
9 recommendation, and a decision will be made in the next
10 several weeks. So thank you again for coming, and the
11 hearing is adjourned.

12

13 (Whereupon the proceedings adjourned at 11:14 a.m.)

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1 I, Brittany Flores, a Certified Shorthand Reporter of
2 the State of California, duly authorized to administer
3 oaths, do hereby certify:

4 That the foregoing proceedings were taken before me
5 at the time and place herein set forth; that a record of
6 the proceedings was made by me using machine shorthand
7 which was thereafter transcribed under my direction;
8 that the foregoing transcript is a true record of the
9 testimony given.

10 I further certify I am neither financially interested
11 in the action nor a relative or employee of any attorney
12 of party to this action.

13 IN WITNESS WHEREOF, I have this date subscribed my
14 name.

15

16 Dated:

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19 _____
Brittany Flores CSR 13460

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